



Standardization of Skin Care Routine Design and Skin Phenotype Diagnosis Facilitates Machine Learning and AI

Leslie Baumann, MD; Skin Type Solutions

Introduction of research

The lack of standardization and hierarchical classification systems for skin types, skin care products and skin care regimens hinder the ability to collect the high-quality data sets needed for machine learning and deep learning processes that are required for accurate AI. Over the last 17 years, we have developed and tested a skin care routine recommendation engine based on a skin typing taxonomy with the help of over 100 dermatologists. This system that is independent from skincare brands, is discussed in the major dermatology and plastics surgery textbooks and used by over 280 doctors in the US. This system is also used commonly in Korea and is the subject of many dermatologic publications.

Body content here

Over 250 medical providers in the US, 100 of which are dermatologists, gave a scientifically validated self-administered skin type diagnostic questionnaire to patients seeking skincare advice. The results obtained include skin typing data on over 100,000 patients, finalization of over 40,000 skincare routine structures, and definition of the skincare product requirements for the "slots" in the skin care routine steps. My lecture will discuss the infrastructure used to collect this data.

Conclusion

A standardized taxonomy and structure allow for generalizability of collected skin type and skincare recommendation data regardless of skincare brand. This type of infrastructure is necessary for accurate machine learning and deep learning used in AI.

References

Baumann, L. (2006). *The skin type solution: a revolutionary guide to your best skin ever*. Bantam.

Baumann, L. (2008, 2012, 2019). *Cosmetics and Skin Care in Dermatology. Fitzpatrick's Dermatology in General Medicine. 7t, 8th and 9th eds. New York: McGraw Hill.*

Baumann, L. (2020). 14 A Scientific Approach to Cosmeceuticals. *The Art of Aesthetic Surgery, Three Volume Set: Principles and Techniques.*

Baumann, Leslie S. "The Baumann Skin Typing System" in Farage MA, et al. *Textbook of Aging Skin Skin*. Springer-Verlag Berlin Heidelberg (2017): 1579-1594.

Baumann, L. (2009). The Baumann skin-type indicator: a novel approach to understanding skin type. *Handbook of Cosmetic Science and Technology, 3rd Edition, Informa Healthcare, New York, 29-40.*



Choi, J. Y., Choi, Y. J., Nam, J. H., Jung, H. J., Lee, G. Y., & Kim, W. S. (2016). Identifying skin type using the Baumann skin type questionnaire in Korean women who visited a dermatologic clinic. *Korean Journal of Dermatology*, 54(6), 422-437.

Lee, Y. B., Park, S. M., Bae, J. M., Yu, D. S., Kim, H. J., & Kim, J. W. (2017). Which Skin Type Is Prevalent in Korean Post-Adolescent Acne Patients?: A Pilot Study Using the Baumann Skin Type Indicator. *Annals of dermatology*, 29(6), 817-819.

Baumann, Leslie. "Validation of a Questionnaire to Diagnose the Baumann Skin Type in All Ethnicities and in Various Geographic Locations" *Journal of Cosmetics, Dermatological Sciences and Applications* 6 (2016): 34-40.

Baumann, Leslie S., et al. "A Validated Questionnaire for Quantifying Skin Oiliness" *Journal of Cosmetics, Dermatological Sciences and Applications* 4 (2014): 78-84.

About the speaker



Leslie Baumann, M.D. founded the University of Miami Cosmetic Medicine and Research Institute in 1997- the first academic institute in the US dedicated to cosmetic dermatology. She served as Professor of Dermatology at the University of Miami, Miller School of Medicine until 2006 when the Institute became independent from the University and the name changed to the Baumann Cosmetic and Research Institute. Dr. Baumann is the author of 3 bestselling books: *Cosmetic Dermatology: Principles and Practice* (McGraw-Hill 2009), *Cosmeceuticals and Cosmetic Ingredients* (McGraw Hill 2014), and *The Skin Type Solution* (Bantam 2005). Dr. Baumann has been involved in the Phase 3 FDA clinical research trials of the most notable products procedures in cosmetic medicine including Botox®, Dysport®, Emverel®, Juvéderm®, Kybella®, Restylane Silk®, Sculptra®, and Voluma®.

She earned her medical degree from Baylor College of Medicine in Houston, Texas, and completed her residency in Dermatology at the University of Miami, Miller School of Medicine. She is a board-certified dermatologist, member of the American Academy of Dermatology (AAD) and a Fellow of the prestigious American Dermatological Association (ADA).